

REMARKS

The drawings have been changed. Claims 1-13 are cancelled. New claims 14-27 have been added and include no new matter. Thus, claims 14-27 remain in this application.

Claims 14- 27, as presented, are patentably distinct over the prior art cited by the Examiner, and are in full compliance with the requirements of 35 U.S.C. §112. These claims are presented, not for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103, or 112, but simply to clarify the invention and to round out the scope of protection to which Applicants are entitled.

New independent claim 14 recites:

“Apparatus for forming a hologram comprising:

synthesizing means for producing a synthetic image by pasting a generated image onto a three-dimensional image model, wherein said three-dimensional image model is at least a portion of a three-dimensional object; and

generating means for producing a parallax image train from said synthetic image.”

Each of the other independent claims 18, 21, 23, 25 and 26 recite similar recitations.

The term “three-dimensional image model” (previously referred to as a “stereo image model”), as used in the claims of the present application, means a three-dimensional image that constitutes a “model” on which a two-dimensional image (“2D image”), for example, an image taken by a digital camera, is “pasted.” As illustrated in Fig. 6, and described at lines 3-10 of page 20, the 3D head without the facial features (56a) is one example of the “three-dimensional image model” on which the 2D image of, for example, a person’s face (57) is pasted. See also, page 16, second and last paragraphs.

Each of claims 15, 19, 22 and 24 recites, in part, “recording each image of the parallax image train as an element hologram on a sensitive material by exposing the sensitive material to an object beam and reference beam at the same time.”

The present application supports the above-quoted limitation at, in particular, lines 6-13 of page 14. See also, page 7 (lines 12, 14-19), page 8 (fourth paragraph), page 10 (last line), page 11, (first line), line 6 of page 14 to line 1 of page 15, and page 15 (lines 7-17).

The present invention claims an apparatus and method in which a two-dimensional image taken from a photographic unit, such as, a digital camera, is “pasted” to a three-dimensional image generated by a 3D image source, as shown in Fig. 5. Such pasting, performed in the image synthesizer 51, differs from the combining or inserting operation taught by Tabata (the reference cited by the Examiner; see column 27, line 38) in the following points.

The term “insertion,” used in Tabata, means inserting a background image (a pair of 2D images) to a pair of 2D images of a target object, which is similar to superimposing two separate 2D images taken by a camera. On the other hand, “pasting,” as performed in the present invention (illustrated in Fig. 6, and described at line 14 of page 16, to line 11 of page 17), means that a 2D image (57) is pasted on a three-dimensional image model (56a) in a 3D image (55), to then render the “combined” images to produce a parallax image train (59) (see also, the example described in lines 3-8 of page 20). Pasting does not require, moreover, determining distances between two-dimensional images, as is required in Tabata’s “insertion.” Instead, Applicants’ device combines a two-dimensional image to a three-dimensional image model. Accordingly, the terms “pasting” and “combining,” as used in the present invention, are not analogous to the term “insertion” used in Tabata.

In addition, the term “rendering,” as used in Tabata, is based on parameters of position or orientation of the two-dimensional image projection planes (column 9, lines 59-61), and, thus, differs from the term “rendering,” as used in the present invention. With Applicants’ device, “rendering” means producing a parallax image train from a synthetic image (page 16,

line 9) that is generated by combining the three-dimensional object image with a two-dimensional image (page 16, lines 5-6).

In further contrast to “pasting,” as performed in the present invention, the “background insertion process” described in Tabata (column 27, lines 47-48) is performed by creating separate 2D images of left and right eyes (see, for example, column 10, lines 35 to 37), which are displayed respectively in different displays provided in a head-mounted device (column 9, line 41). The three dimensional effect in Tabata is, thus, obtained by “projecting two images of the object on corresponding two-dimensional image projection planes, respectively, the projected images being viewed in a virtual three-dimensional space with the two eyes” (column 9, lines 53-57); “a three dimensional space image, which is formed when the left and right images described before...are displayed on the left and right display element screens [of the head-mounted device]” (column 12, 46-49). Such two images are made different for displays of the left and right eyes based on a depth distance (column 9, line 49) between the eyes and the target object (column 9, lines 46-49).

Also distinguishable from the “pasting” of the present invention, the “combining” in Tabata is performed by inserting “background image data concerning the background of the object” and supplying the “data obtained as a result of this process to the HMD” (column 10, lines 2-6).

Thus, in Tabata, the virtual three-dimensional space is recognized as a 3D image only when wearing the head-mounted device and displaying respective 2D images to each eye. On the other hand, viewing the 3D images according to the present invention requires neither a head-mounted device nor two displays displaying two different images for each eye. Instead, the present invention provides multiple (i.e., considerably more than two) element holograms

arranged horizontally in succession (see page 15, lines 13-14), which are displayed (or printed) in one display (or recording medium).

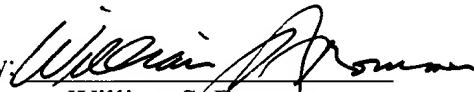
Applicants further submit that because Tabata does not meet all the limitations of the independent claims of the present invention, the combination of Tabata and Benton is an insufficient basis for rejecting such claims. Accordingly, Applicants submit that the present application is in condition for allowance. An early notice to this effect is respectfully solicited.

The foregoing comments concerning the disclosures in the cited prior art represent the present opinions of Applicants' undersigned attorney and, in the event, that the Examiner disagrees with any such opinions, it is requested that the Examiner indicate where in the reference or references, there is the bases for a contrary view.

Please charge any fees incurred by reason of this response to Deposit Account No. 50-0320.

Respectfully Submitted,

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